APPENDIX A

TECHNICAL MEMORANDA

Technical Memorandum

SR 303L/Northern TI
Alternatives Evaluation Technical Memorandum and Recommendation of Preferred Alternative

SR 303L I-10 to US 60 DCR/EA
MCDOT Work Order # 69016

June 9, 2003

PURPOSE

The purpose of this memorandum is to document the development of various SR 303L/ Northern TI configurations, the evaluation of those different TI configurations and the recommendations resulting from those evaluations.

BACKGROUND

As part of its contract with the City of Glendale, URS is developing the "Super Street" concept for the Northern Avenue corridor from Grand Avenue to SR 303L. The Super Street will have grade-separated interchanges at the major mile cross streets and traffic signals at the minor half-mile cross streets and is expected to carry upwards of 80,000 vehicles per day with an average travel speed of 45 mph. The typical section would consist of three lanes over the major cross streets and four lanes with no left turns at the minor ones. The Northern Super Street will follow along the current Northern Avenue alignment from Grand Avenue to Dysart Road. At Dysart Road, the roadway alignment shifts ½ mile north to avoid Luke AFB clear zone. As originally proposed by Glendale west of Reems Road, the roadway would shift ½ mile south to return to the existing Northern Avenue alignment and intersect SR 303L at the current Northern Avenue location. Northern will become a major east-west thoroughfare and the connection to SR 303L needs to be carefully considered.

DEVELOPMENT OF ALTERNATIVES

A stakeholder meeting was held on April 29, 2003 and major stakeholders present included MCDOT, ADOT, FHWA, MAG, City of Goodyear, City of Glendale, Luke AFB and FCDMC. At that meeting, URS showed two alternative configurations for the SR 303L/Northern TI:

1. Option 1 – This concept consists of a SPUI interchange at the current Northern Avenue location with a directional flyover ramp for the WB-to-SB movement. This was the original TI concept proposed by the City of Glendale (See Figure 1).
2. Option 2 – This concept assumes that the Northern Superstreet remains ½ mile north of the existing Northern Avenue alignment and intersects SR 303L between Olive Avenue and Northern Avenue. Directional ramps would provide free-flow connections for the WB-to-SB and NB-to-EB movements. The ramps on the south side of the Olive TI and the north side of the Northern Avenue TI would be eliminated. One-way frontage roads would connect Olive and Northern and allow all other movements onto SR 303L via the frontage roads (See Figure 2).

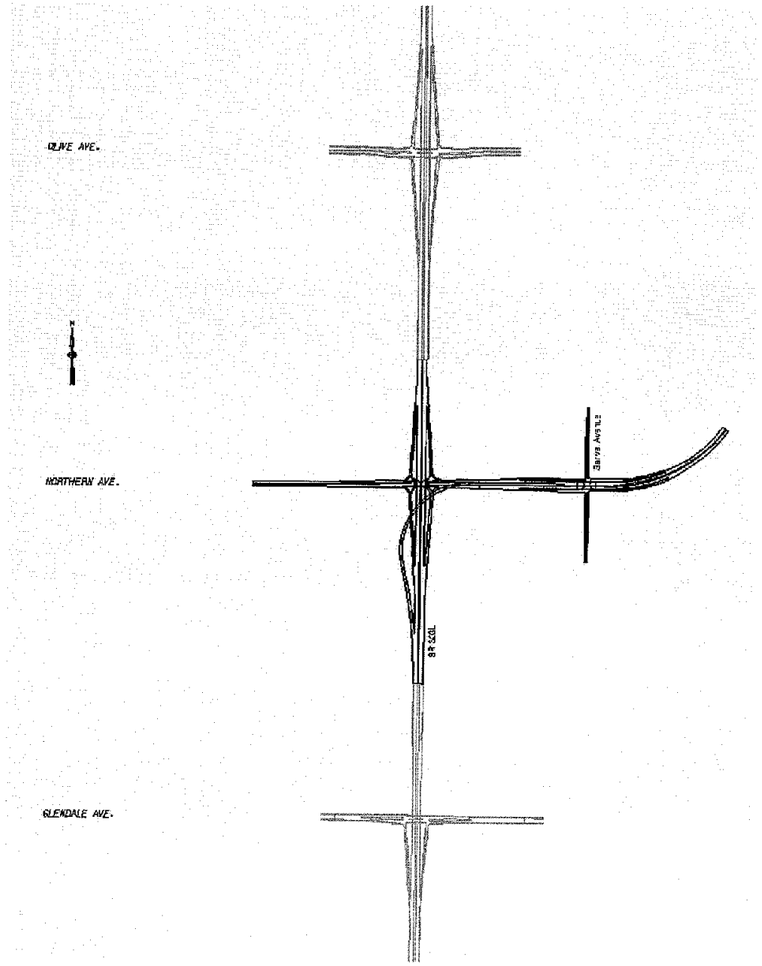


Figure 1
Option 1
SR 303L/Northern TI
At Existing Northern Avenue Location

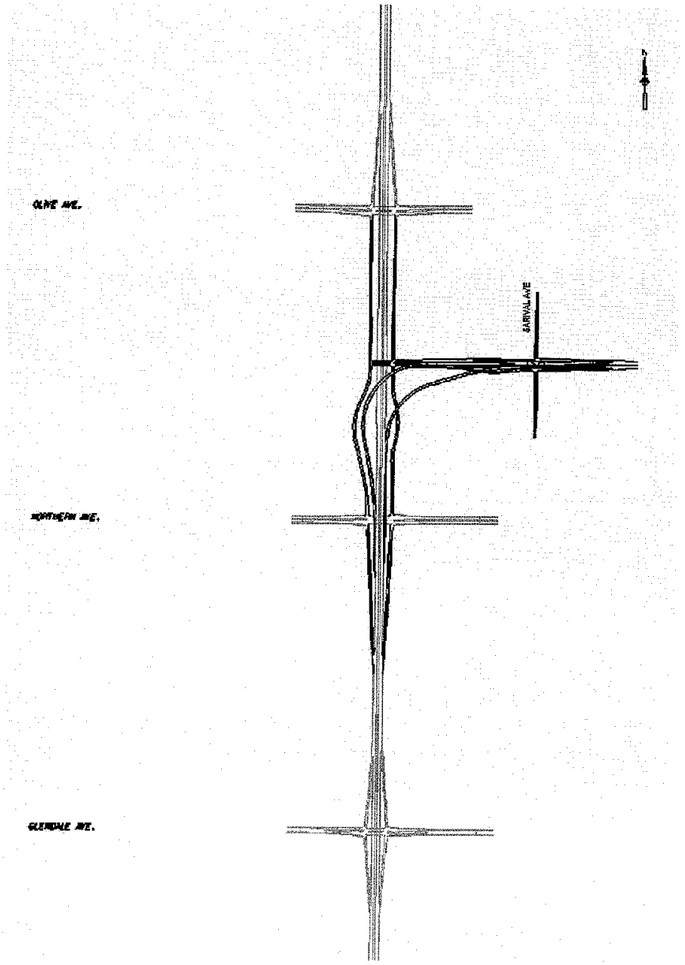


Figure 2
Option 2
SR 303L/Northern TI
At Half Mile Section Line with Frontage Roads

FHWA raised concerns that Option 1 would require three ramps on SB SR 303L between Northern Avenue and Glendale Avenue. At the very least, the ramps on the north side of the Glendale Avenue TI would probably have to be eliminated to accommodate this configuration (Figure 1 reflects the ramp elimination).

A coordination meeting was held on May 13, 2003 between ADOT, MCDOT and URS where Options 1 and 2 were presented for comment. ADOT noted that Option 1 seemed more desirable due to the simpler configuration and signing requirements.

At the regular bi-monthly project status meeting on May 19, 2003, which was attended by MCDOT and URS, four TI configurations were presented:

1. Option 1 – Similar to configuration presented on April 29.

2. Option 2 – Similar to configuration presented on April 29.

3. Option 3 – This option is similar to Option 2 in that is provides flyovers for the WB-to-SB and NB-to-EB movements to and from the Northern Super Street. However, the frontage roads were eliminated and a flyover would be provided at Olive Avenue for the SB-to-EB movement. The ramps on the south side of Olive and the south side of Peoria were eliminated, as well as all four ramps at existing Northern. The ramps on the west side of the Sarival/Northern Super Street TI were eliminated (See Figure 3).

4. Option 4 – This option has fully directional ramps for all movements at the Northern Super Street. All ramps were eliminated at Olive and Northern, and those streets would be grade separated only at SR 303L. The ramps on the west side of the Sarival/Northern Superstreet TI were eliminated. Olive Avenue would tie into the Northern Superstreet at Reems Road (See Figure 4).

A brief evaluation matrix comparing all four options based on number of free-flow connections, number of ramps eliminated and relative construction cost was presented at the meeting.

A coordination meeting was held on May 28, 2003 between ADOT, City of Glendale and URS in order to discuss the four TI options presented in the project status meeting on May 19. An evaluation matrix compared and ranked all four options based on number of free-flow connections, number of ramps eliminated, additional ROW required, simplicity of connection to the Northern Super Street, number of half diamonds, direct access to the regional park, ease of phased development and relative construction cost. A fifth option (Option 5) was suggested by the City of Glendale in the meeting that combines the split diamond and frontage roads of Option 2 and the full system TI of Option 4 (See Figure 5).

As described above, the five TI alternatives were developed in concert with MCDOT, ADOT, the City of Glendale and other stakeholders through a series of meeting and consultations where comments were made and the different configurations were refined. Option 1 was revised to delete the ramps on the north side of the Glendale TI in response to FHWA's comments at the stakeholder meeting held on April 19, 2003. Other options were similarly refined based on comments at various meetings, mainly to the number of ramps eliminated at nearby TI's. The configurations shown in Figures 1 through 5 are the final iterations to date.

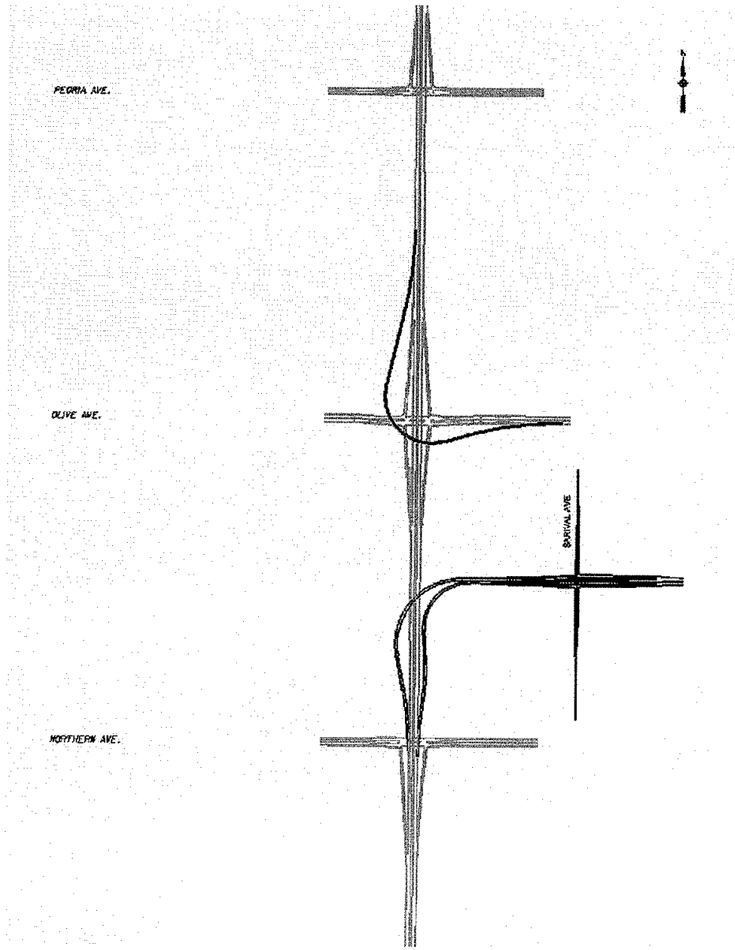


Figure 3
Option 3
SR 303L/Northern TI
At Half Mile Section Line with Directional Ramp at Olive

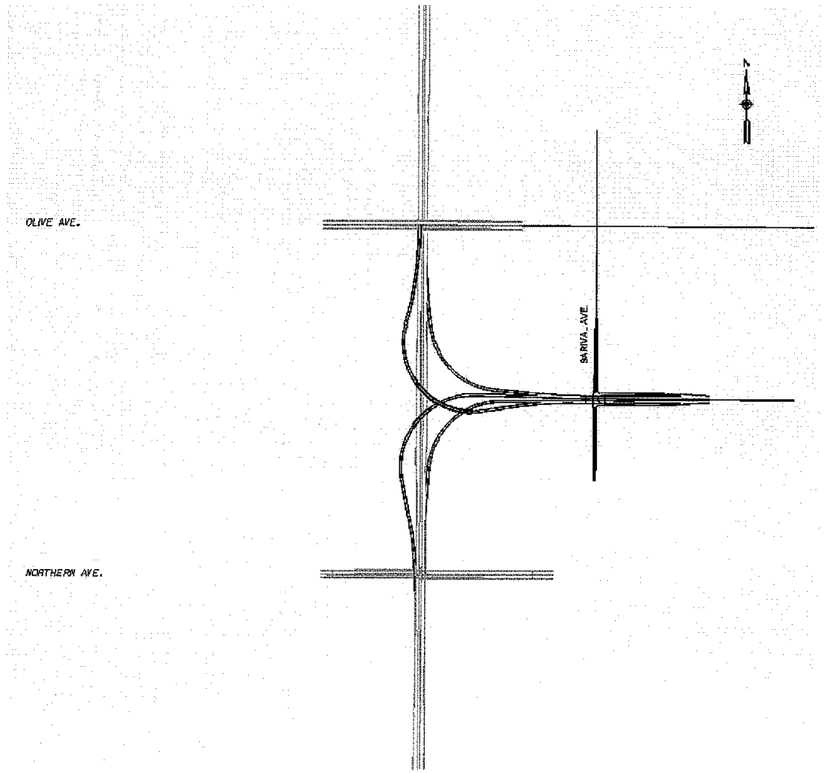


Figure 4
Option 4
SR 303L/Northern TI
At Half Mile Section Line with Full System TI

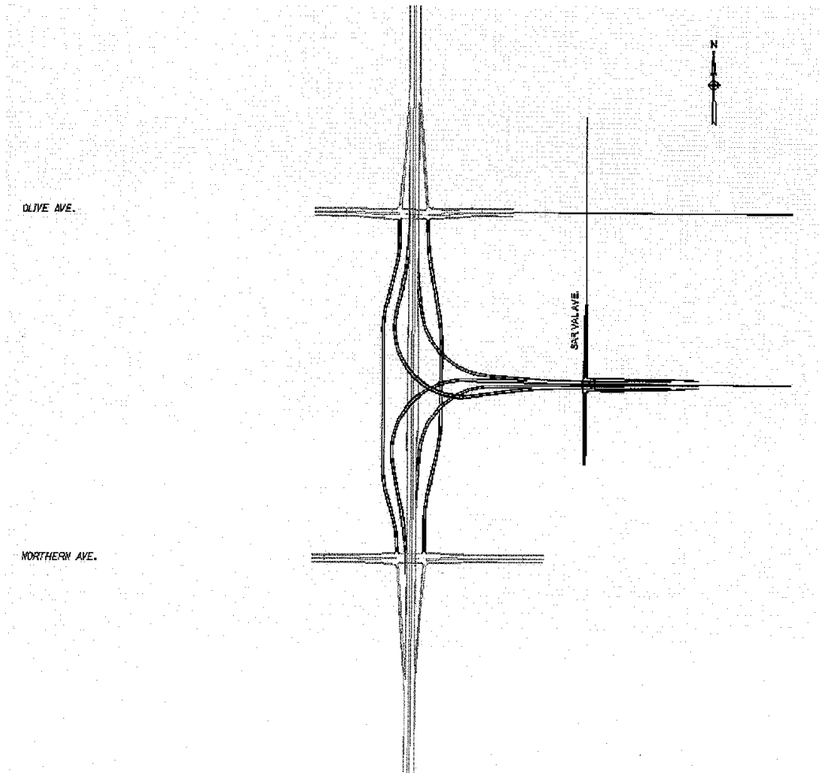


Figure 5
Option 5
SR 303L/Northern TI
At Half Mile Section Line with Full System TI and Frontage Roads

EVALUATION OF ALTERNATIVES

The five Northern TI options were evaluated and ranked on several different factors:

1. Number of free-flow connections – Number of ramps that provide fully directional, free-flow traffic movements between SR 303L and the Northern Super Street. Configurations with more free-flow connections are ranked higher.

2. Number of ramps eliminated – Number of ramps that have to be eliminated from nearby TI's due to the proposed SR 303L/Northern TI configuration. Configurations that eliminated fewer ramps are ranked higher.

3. Additional ROW required – Additional ROW required by the proposed SR 303L/Northern TI configuration over and above the current ROW set aside for SR 303L. ROW from eliminated ramps was assumed to remain and not be sold off. Configurations that require less additional ROW are ranked higher.

4. Simplicity of connection – The simplicity of connection between SR 303L and the Northern Super Street. Takes into account how confusing signing might be, how well the TI coincides with driver expectations and how direct the route is to Northern. Configurations that would be less confusing and less complex are ranked higher.

5. Number of half diamonds – Half diamond TI's are generally not favored because of potential driver confusion. Configurations with fewer half diamonds are ranked higher.

6. Direct access to the regional park – This factor measures the directness or circuitousness of the access to the White Tank Regional Park located west on Olive Avenue. Configurations with more direct access to the park are ranked higher.

7. Ease of phased development – The ease of constructing parts of the configuration as an interim TI configuration. Also takes into account the ease of upgrading the interim TI to the ultimate configuration. Configurations that are more easily constructed in phases are ranked higher.

8. Relative construction cost – A broad-brush estimate of relative construction cost of the configurations, not including additional ROW costs. Less expensive configurations are ranked higher.

At the coordination meeting held on May 29, 2003, ADOT and the City of Glendale expressed disfavor with Option 2 because it provides indirect movements between the Northern Super Street and the north leg of SR 303L. Connections to Olive from SR 303L south leg would also be indirect and require traffic to pass through 2 or 3 signalized intersections. Option 3 was also not favored because of the separation of movements from SR 303L to Olive and Northern. There would be driver confusion to exit at Olive to reach Northern. These comments were considered in the evaluation and ranking. The evaluation matrix is shown in Figure 6. Option 1 would provide unbalanced capacity for the various movements between SR 303L and Northern Super Street. Option 1 would eliminate access to too many arterials.

Northern Superstreet TI Comparison - Ranked

	OPTION									
	1		2		3		4		5	
	Rank	Comments	Rank	Comments	Rank	Comments	Rank	Comments	Rank	Comments
No. of Free-Flow Connections	4	1 @ Northern: WS	3	2 @ Northern: WS & NE	2	2 @ Northern: WS & NE 1 @ Olive: SE	1	4 @ Northern: WS, NE, SE, WN	1	4 @ Northern: WS, NE, SE, WN
No. of Ramps Eliminated	1	2 - N. side of Glendale	2	Ramps between Olive & Northern replaced by frontage roads	3	2 - S. Side of Peoria 2 - N. Side of Northern	4	All 4 at Olive All 4 at Northern 2 - W. side of TI at Sarival & Northern SS	2	Ramps between Olive & Northern replaced by frontage roads; 2 - W. side of TI at Sarival & Northern SS
Additional ROW Required	1	Add'l ROW req'd in SW quad.(~ 5 ac)	3	Add'l ROW req'd betw. Olive & Northern for FR & ramps (~ 45 ac)	3	Add'l ROW req'd @ Olive & N. of Northern (~ 40 ac)	4	Add'l ROW req'd betw. Olive & Northern for ramps (~ 40 ac)	5	Add'l ROW req'd betw. Olive & Northern for ramps & SR (~ 65 ac)
Simplicity of Connection - SR303L & Northern SS	2	Simpler signing - no confusion between Northern SS and Northern Ave.	4	More complex signing and possibility of confusion betw. Northern SS & Northern Ave.; Dir. ramps for WS & NE movements only - all other movements require exiting 1/2+ mile ahead & going thru FR	3	Some possibility of confusion betw. Northern SS & Northern Ave.; Only WS & NE movements accommodated - all other movements require use of arterial network to access Northern SS	1	Some possibility of confusion betw. Northern SS & Northern Ave.; All movements accommodated to/from Northern SS	1	Some possibility of confusion betw. Northern SS & Northern Ave.; All movements accommodated to/from Northern SS
No. of Half Diamond TI's	2	1 Half Diamond @ Glendale	1	No Half Diamonds	2	1 Half Diamond @ Peoria	1	No Half Diamonds	1	No Half Diamonds
Direct Access to White Tank Regional Park	1	Exit ramps @ Olive	2	Exit ramps on N. side of Olive w/ FR on S. side	1	Exit ramps @ Olive	4	No ramps @ Olive; must reach park using arterial network	2	Exit ramps on N. side of Olive w/ FR on S. side
Phased Development	2	SPUI @ Northern could be built in interim and flyover added later when warranted	3	FR could be built in interim and dir. ramps built later when warranted	1	Dir. ramp @ Olive could be delayed until warranted	4	Dir. ramps could be built separately as warranted, but should be built all at once	3	FR could be built in interim and dir. ramps built later when warranted
Relative Construction Cost	1	Least - addition of one flyover bridge and retaining walls	3	Moderately costly - 4 bridges, retaining walls, 2 miles of frontage roads	2	Moderate - 2 flyover bridges	2	Moderate - 2 flyover bridges	4	Most - 5 bridges & 2 miles of FR

Figure 6
Evaluation Matrix

RECOMMENDATION

Option 5 is recommended as the preferred configuration and inclusion in the DCR for the SR 303L/ Northern TI. It offers the highest capacity interchange with all movements accommodated equally to and from SR 303L. The only ramps that would be eliminated are those on the west side of the Northern/Sarival grade-separated intersections, which greatly simplifies the configuration. The ramps that would be eliminated between Northern Avenue and Olive Avenue are replaced by frontage roads, which still maintain access to those streets, and to the White Tank Regional Park via Olive. Construction can be phased to some extent, with the frontage roads and individual ramps, although building the entire TI at once would be more cost and operationally efficient. The primary disadvantage of Option 5 is the increased construction and ROW costs.

Technical Memorandum

SR 303L/US 60 (Grand Avenue) TI
Alternatives Evaluation and
Recommendation of Preferred Alternative

SR 303L I-10 to US 60 DCR/EA
MCDOT Work Order # 69016

The purpose of this memorandum is to document the development of various SR 303L/US 60 TI alternatives, evaluation of those alternatives, and selection of the recommended preferred alternative.

The Partial Cloverleaf (par-clo) Interchange was the recommended TI configuration at this location under a Technical Design Memorandum prepared by Cannon & Associates, Inc. in August 1999 for Maricopa County Department of Transportation (MCDOT). Two primary reasons prompted a re-evaluation of this earlier recommendation. The 2030 traffic forecasts are much higher than those used in the previous study. As a result, there were concerns about the ability of the par-clo to satisfactorily meet the future traffic demand. Secondly, the par-clo includes a loop off-ramp from SR 303L. ADOT's experience with such ramps indicates a high rate of accidents and truck overturning due to the drastic slowdown required from freeway speeds to a 25 mph sharp curve on a down grade.

URS has developed, analyzed, and evaluated several different alternatives for this TI location. These alternatives were developed and evaluated for the ultimate configuration at this location. New 2030 traffic forecasts were received from the Maricopa Association of Governments (MAG) and were utilized in the analysis of the alternatives. All alternatives were evaluated based on several different factors including: traffic operation, geometric, right-of-way, environmental impacts, construction costs, Burlington Northern Santa Fe (BNSF) Railroad impact, structures, drainage, and constructibility.

In Iteration 1, four alternatives were identified and evaluated as described below. Two alternatives were eliminated from further consideration, and two additional alternatives were identified. In Iteration 2, these two new alternatives were compared with the initial two remaining alternatives. From this analysis, Alternative 3 was chosen as the recommended alternative.

Note that SR 303L is considered a north-south route and US 60 is an east-west route. In this paper, NB means northbound, WB means westbound, etc.

Iteration 1

Four alternatives, including the par-clo, were developed and presented at the first project stakeholders meeting on April 29, 2003. These alternatives are shown in Exhibit A. Following is a brief description of those alternatives:

Alternative 1 (Partial Cloverleaf) – Loop on- and off-ramps would be needed on the south side of US 60. Acceleration and deceleration lanes on SR 303L would be required. Several lanes would have to be added to US 60 in order to make this configuration work. Heavy left-turn movements interfere with through traffic, reducing efficiency.

Alternative 2 (Platform Diamond) – Ramps and intersections would be depressed under the railroad and US 60 creating a third-level diamond configuration. US 60, railroad and SR 303L roadways would stay at current grade. Left-turn movements would be separated from through movements. This alternative would require additional railroad right-of-way parallel to the tracks to accommodate the WB ramp connector. Several structures and retaining walls would be needed to construct ramps at the bottom level, resulting in poor geometry and limited sight distance.

Alternative 3 (Stacked Diamond) [SPUI]) – Ramps and intersection would be depressed under the railroad and US 60 creating a third level with ramps in a single point urban interchange (SPUI) configuration. US 60, railroad and SR 303L roadways would stay at current grade. All left turns would be controlled by a single two-phase traffic signal. This configuration allows for better geometric, better sight distance and efficient operation. Two ramps would cross under the BNSF Railroad.

Alternative 4 (Semi-Directional) – Directional ramps over and under SR 303L and US 60 would provide all movements except the NEB-to-SEB, SEB-to-SWB and the NWB-to-SWB movements. These movements would be provided by conventional diamond-type ramps with left and right turns. This alternative would need right-of-way near Sun City West. This configuration would require four levels and would probably have the highest noise impacts. 163rd Avenue intersection with US 60 would need to be relocated to the west, because of close proximity of the tie-in point of the directional off-ramp from NB 303L to WB US 60 on-ramp.

Some concerns were raised during the stakeholders meeting regarding Alternative 2 (Platform Diamond) and Alternative 4 (Semi-Directional). Sight distance was a concern with Platform Diamond configuration. The issues with Semi-Directional configuration were a need to acquire multiple residences from Sun City West and noise impact to adjacent residences in Sun City Grand and Sun City West. An evaluation matrix for these four alternatives is shown in Exhibit B. The evaluation was reviewed with ADOT staff during a coordination meeting. ADOT suggested that Alternatives 2 and 4 be dropped from further consideration due to operational deficiencies and environmental impacts.

Alternative 2, Platform Diamond, was eliminated for the following primary reasons:

- Encroachment in BNSF right-of-way
- Limited sight distance on ramps and ramp connectors.
- Less capacity than Alternative 3

Alternative 4, Semi-Directional, was eliminated for the following primary reasons:

- Potential noise and visual impact on nearby residences
- High construction costs
- Needs most additional right-of-way

Iteration 2

Two additional alternatives emerged through discussions with ADOT and MCDOT staff as described below. These alternatives, 5 and 6, are also illustrated in Exhibit A.

Alternative 5 (Combination 3-Level) – This alternative replaces SB 303L exit loop ramp in the NW quadrant from the par-clo alternative with directional ramps below US 60 and railroad in NE and SW quadrants. Two opposite direction ramps creates SPUI configuration below US 60. NB 303L on loop ramp in the SW quadrant from the par-clo alternative will remain.

Alternative 6 (Combination 4-Level) – This alternative is the same as Alternative 5 except that the NB 303L loop on ramp is in the NW quadrant. This ramp would fly over SR 303L and enter NB SR 303L just south of the existing bridge.

An evaluation matrix containing ranking was prepared for Alternatives 1, 3, 5, and 6 and was reviewed with ADOT staff. This matrix is shown in Exhibit C.

Alternative 1 (Par-Clo) fared better than other alternatives in most categories except traffic operation, geometry, and noise impacts. It would be simple to construct, would be least expensive, and would require minimum amount of new right-of-way. It is, however, the only alternative with unacceptable level of service for design year (2030) traffic volumes. Heavy left-turn traffic on US 60 would conflict with through traffic and would reduce TI efficiency drastically. Low design speed loop ramps would not operate efficiently for the design year. Loop exit ramps from a freeway are not desirable.

Alternatives 5 and 6 would operate at the acceptable level of service, but both alternatives would require one or more traffic signals on US 60 and would require a loop on-ramp to NB SR 303L. Alternative 6 would concentrate all on-ramp traffic at one intersection, requiring triple left-turn lanes on US 60. Both alternatives would have free flow directional ramps in NB to WB and SB to EB direction. Both alternatives would require a structure for ramps to go under US 60 and BNSF. Detouring US 60 and BNSF Railroad shoo-flying would be needed for both alternatives.

Alternative 3 (Stacked Diamond [SPUI]) would be the most desired alternative operationally and geometrically. It is the only alternative that does not require traffic signals on US 60. The ramp geometry is the best for turning traffic. It would have least noise impact on the adjacent residences. Although specific cost estimates have not been prepared at this time, it appears that this alternative would be more expensive than Alternatives 1, 5, and 6.

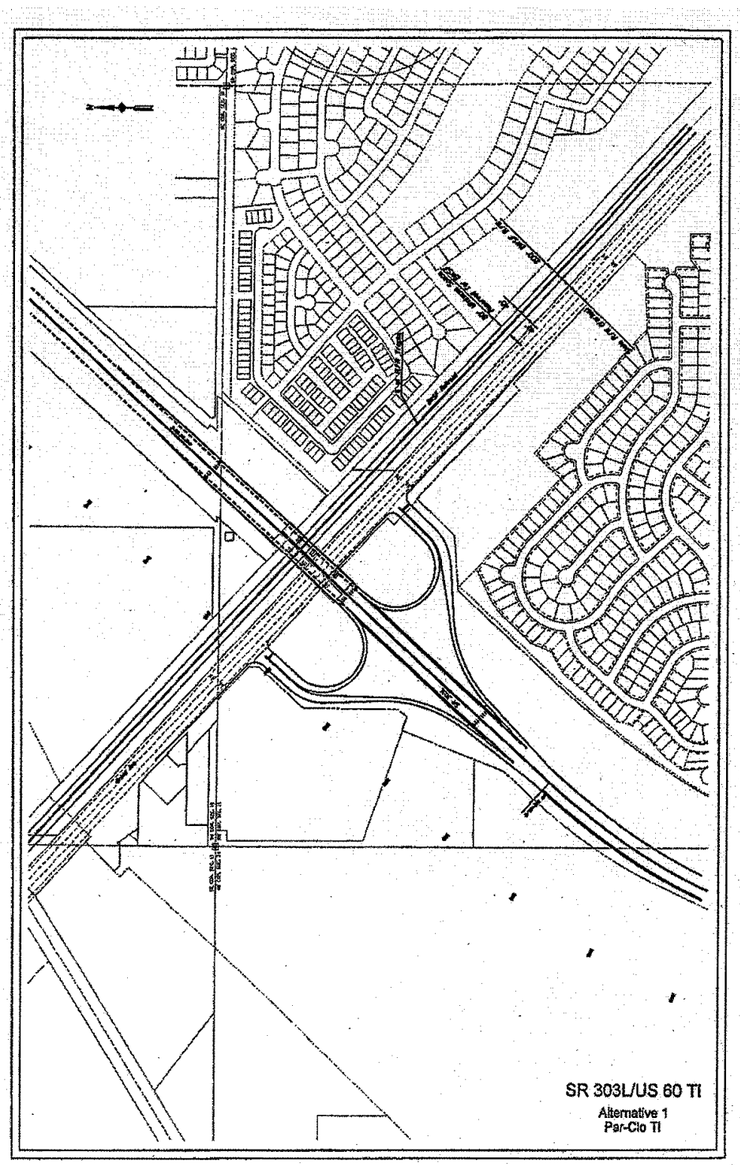
Recommendation

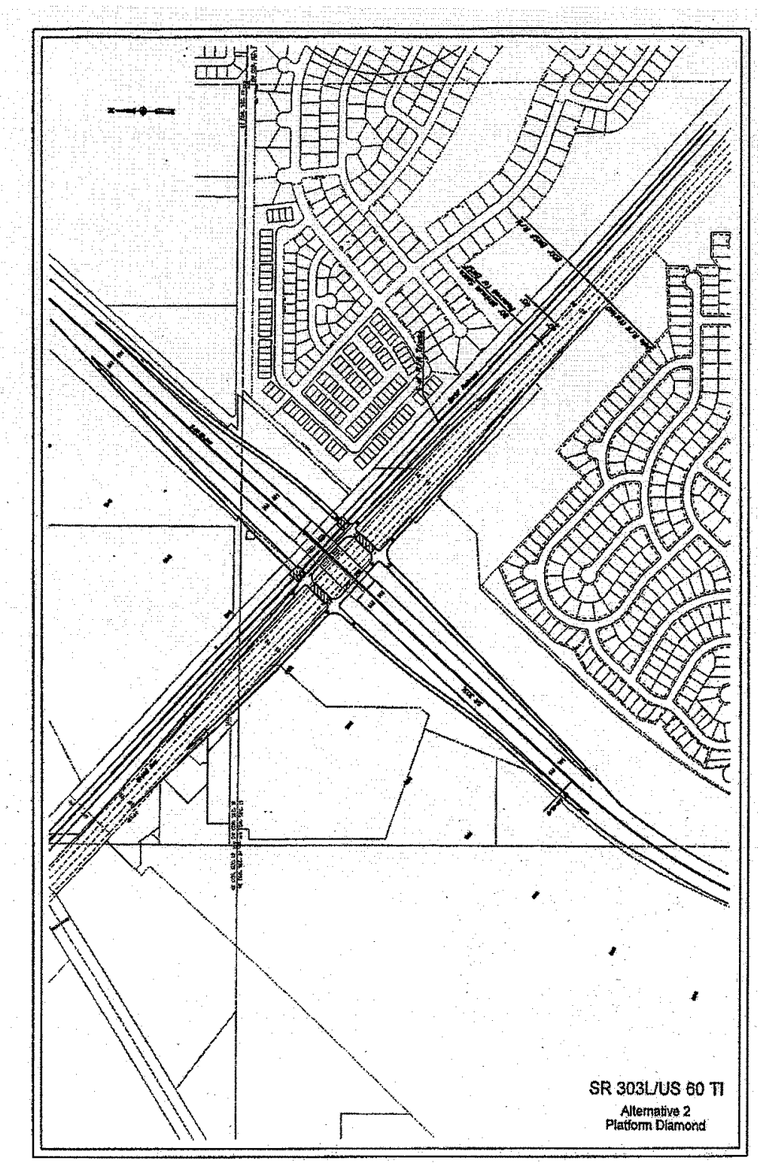
After evaluating all alternatives based on criteria described above and input received from stakeholders, Alternative 3 (Stacked Diamond [SPUI]) is recommended as the preferred alternative for the following reasons:

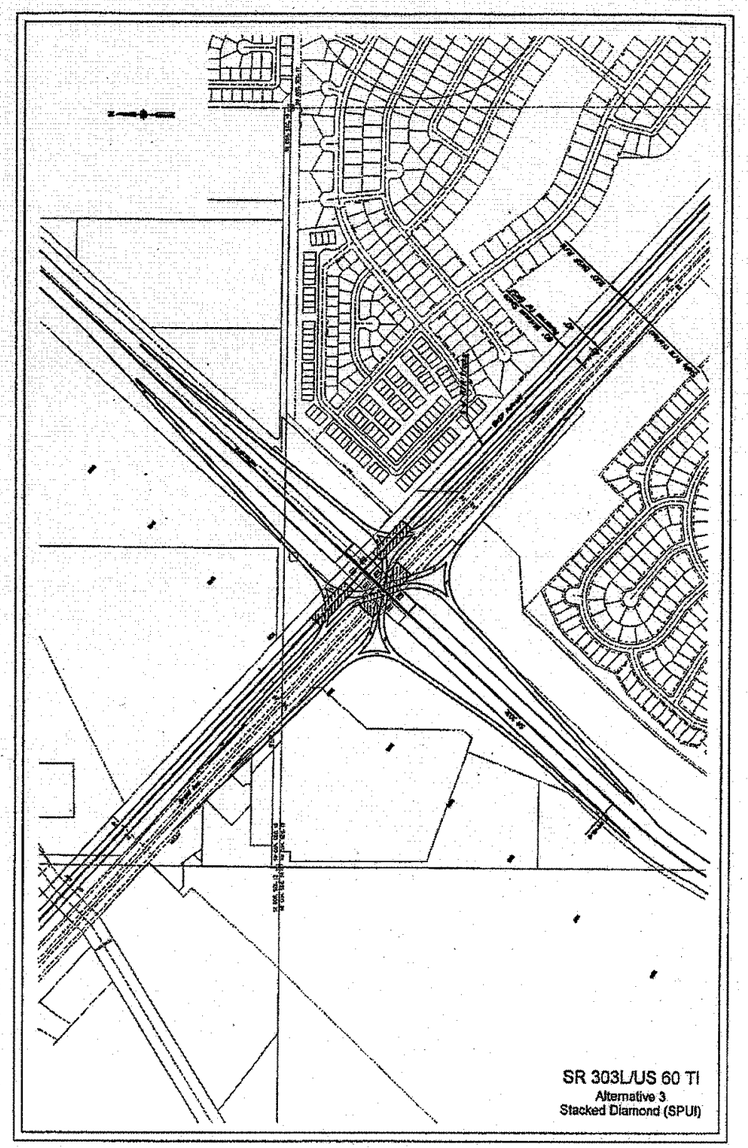
- Traffic operation superior than all other alternatives evaluated for design year (2030) traffic volumes
- Better geometry than all other alternatives evaluated
- Least noise impact to adjacent residences than all other alternatives evaluated
- More balanced earthwork than other alternatives evaluated
- Minimum amount of new right-of-way required

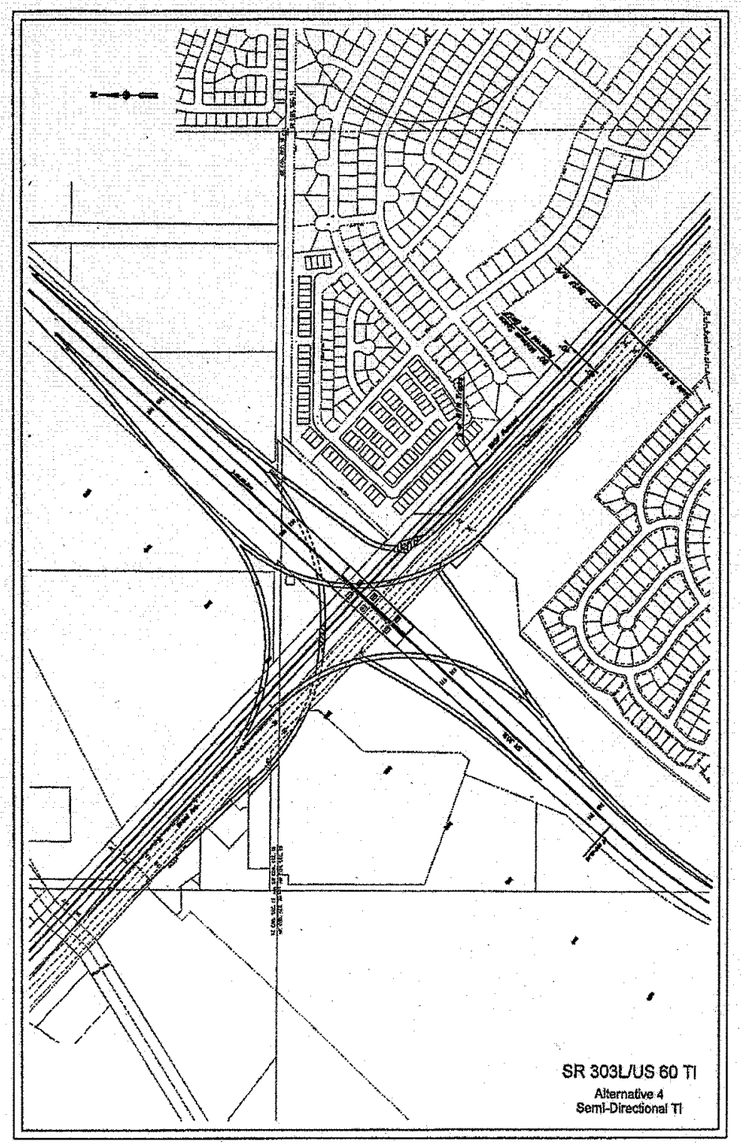
URS recommends that we proceed with more detail analysis of Alternative 3 (Stacked Diamond [SPUI]) in the DCR process.

EXHIBIT A


SR 303L/US 60 TI
Alternative 1
Par-Clo TI


SR 303L/US 60 TI
Alternative 2
Platform Diamond





URS
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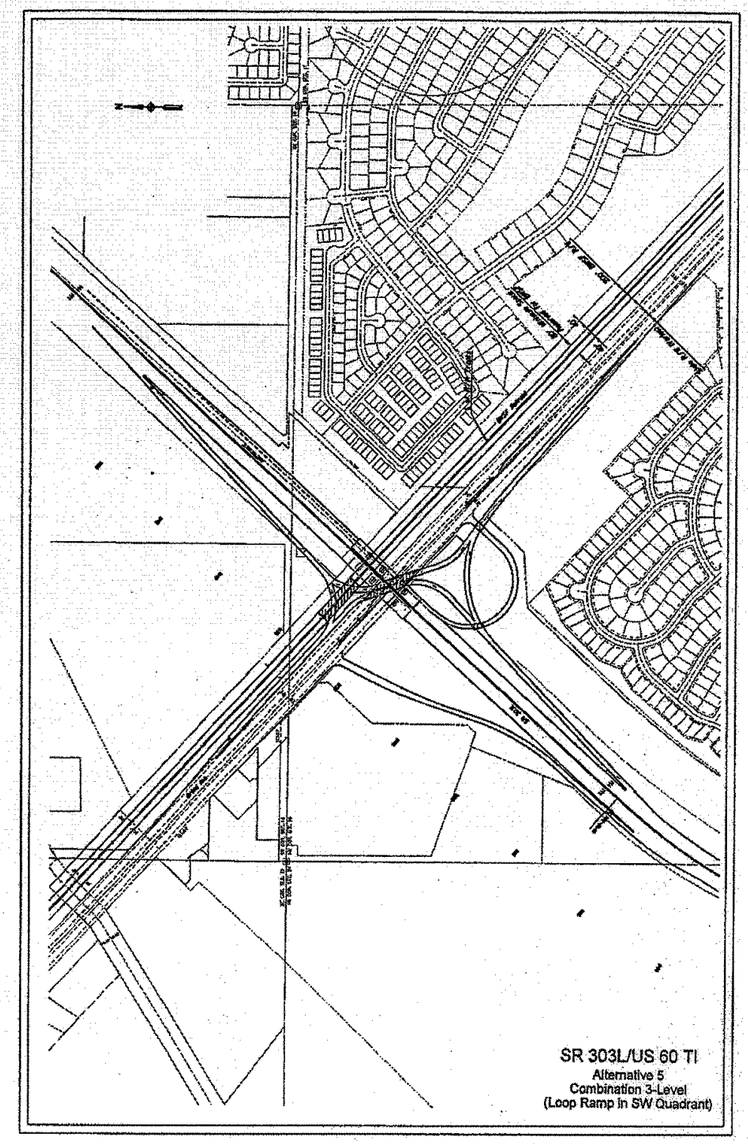

SR 303L/US 60 TI
Alternative 5
Combination 3-Level
(Loop Ramp in SW Quadrant)

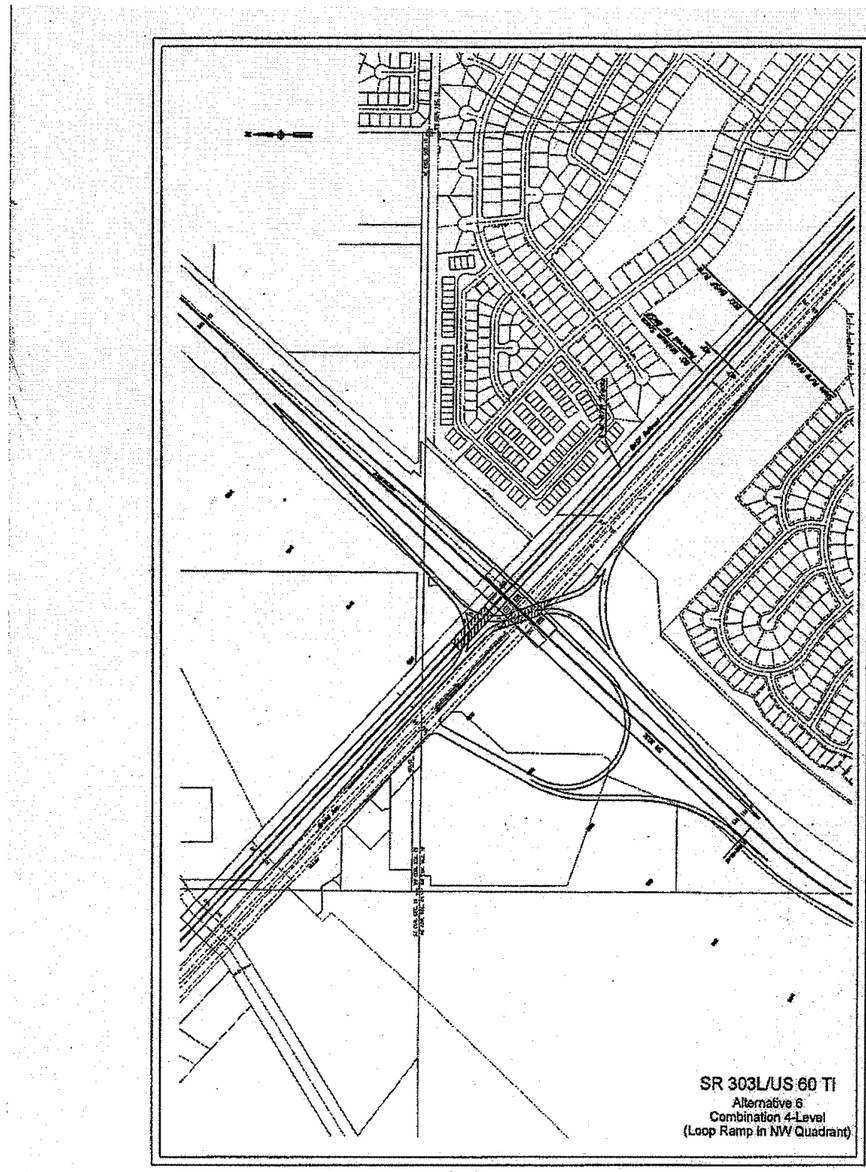

SR 303L/US 60 TI
Alternative 6
Combination 4-Level
(Loop Ramp in NW Quadrant)

EXHIBIT B

SR 303L/US 60 Alternatives Evaluation – Iteration 1

	Alternative 1 (Par-Clo)	Alternative 2 (Platform Diamond)	Alternative 3 (Stacked Diamond [SPUI])	Alternative 4 (Semi-Directional)
Traffic Operation	Unacceptable Level of Service. Traffic Signal @ both ramp intersections, Heavy left-turn traffic conflict w/ through traffic on US 60	Acceptable Level of Service, removes conflicts between heavy turning movements with through traffic. Possible issues with emergency vehicle access	Acceptable Level of Service. Single traffic signal for left-turn movements	Acceptable Level of Service
Geometry	Need low design speed loop ramps, would require long acceleration and deceleration lanes on the mainline	Poor sight distance	Good turning radii for trucks, potential sight distance problem	Tight horizontal and vertical alignments
New ROW Impact	Minimum	Major, significant BNSF ROW needed	Major, significant BNSF ROW needed	Maximum, significant BNSF ROW needed
Structures	Minimum, additional lane width needs to be added for new NB 303L bridge	Major, five new structures including NB 303L bridge, two under BNSF	Major, four new structures including NB 303L bridge, two under BNSF	Maximum, two directional ramps over SR 303L and US 60, one structure each over and under BNSF, one directional ramp under US 60, BNSF and under SR 303L
Retaining Walls	Minimum	Major, needed to retain BNSF, US 60 and bridge piers	Major, needed to retain BNSF, US 60 and bridge piers	Major
Environmental	Minimum	Minimum, ramps under US 60 and BNSF	Minimum, ramps under US 60 and BNSF	Maximum, elevated fly--over ramps, potential noise and aesthetics issue
Drainage	Minimum	Major, pump station may be needed	Major, pump station may be needed	Minor, small pump station may be needed
Construction Costs	Low	Medium	Medium-High	Medium

EXHIBIT C

SR 303L/US 60 Alternatives Evaluation (Ranking) – Iteration 2

	Alternative 1 (Par-Clo)		Alternative 3 (Stacked Diamond [SPUI])		Alternative 5 (Combination 3-Level) (Loop Ramp in SW Quadrant)		Alternative 6 (Combination 4-Level) (Loop Ramp in NW Quadrant)	
	Rank	Comments	Rank	Comments	Rank	Comments	Rank	Comments
Traffic Operation	4	Unacceptable Level of Service. Three-phase traffic Signal @ both ramp intersections, heavy left-turn traffic conflict with through traffic on US 60. Loop ramps need 2 lanes	1	Acceptable Level of Service. Single two-phase traffic signal for left-turn movements, 2-lane movements	2	Acceptable Level of Service. Two, 2-phase signals, NB loop ramp will need to have 2 lanes. NB to WB and SB to EB left turn moves are free flow	3	Acceptable Level of Service. Concentrating all on-ramp movements at one intersection, triple left-turn lanes needed on US 60. NB to WB and SB to EB left turn moves are free flow
Geometry	4	Low design speed loop ramps, would require long acceleration and deceleration lanes on the mainline	1	Good turning radii for trucks, limited sight distance	3	Good turning radii for trucks, limited sight distance, one loop ramp	3	Good turning radii for trucks, limited sight distance, one loop ramp
New ROW Impact	1	Minimum	3	Medium; northside ROW needed for two ramps, southside ROW needed for two ramps	2	Medium, northside ROW needed for one ramp, southside ROW needed for one ramp	4	Major, northside ROW needed for one ramp, southside ROW needed for three ramps
Structures	1	Minimum; acceleration, deceleration lanes needed on SR 303L bridges	4	Major; three new structures plus NB SR 303L bridge; two for BNSF, one for US 60, US 60 structure is most complex	2	Major; four new structures plus NB 303L bridge; one for BNSF, one for US 60, two for loop ramp, acceleration lane needed on NB SR 303L bridge	3	Major; three new structures plus NB SR 303L bridge; one for BNSF, one for US 60, one for loop ramp, acceleration lane needed on NB SR 303L bridge
Retaining Walls	1	Minimum	4	Major, needed to retain BNSF, US 60 and bridge piers	3	Major, needed to retain BNSF, US 60 and bridge piers (less than Alt. 3)	3	Major, needed to retain BNSF, US 60 and bridge piers (less than Alt. 3)

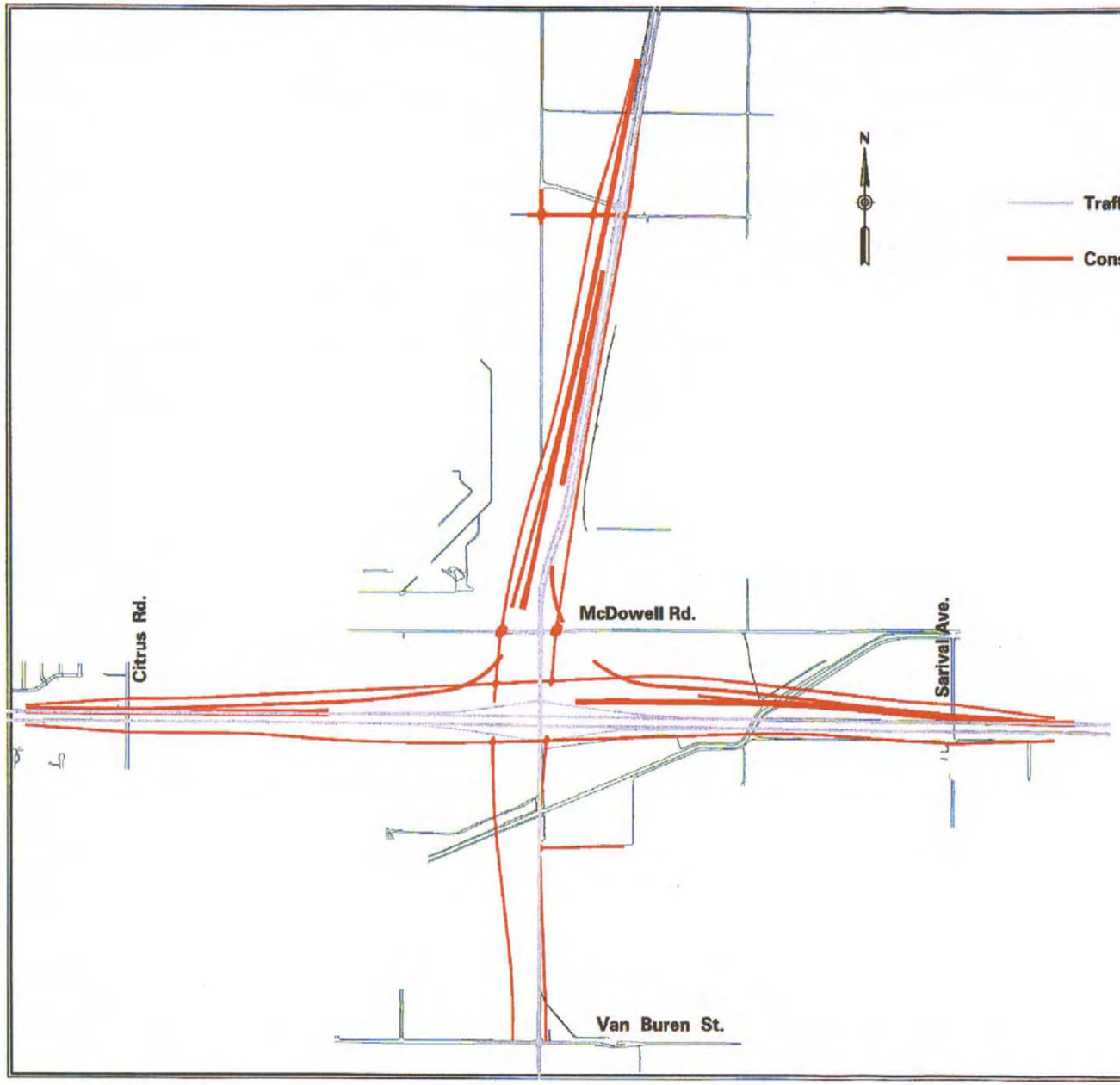
EXHIBIT C (continued)

	Alternative 1 (Par-Clo)		Alternative 3 (Stacked Diamond [SPUI])		Alternative 5 (Combination 3-Level) (Loop Ramp in SW Quadrant)		Alternative 6 (Combination 4-Level) (Loop Ramp in NW Quadrant)	
	Rank	Comments	Rank	Comments	Rank	Comments	Rank	Comments
Noise Impacts	4	All traffic at or above ground level, steep grade on loop ramps	1	Ramp traffic below ground level	3	Two free-flow ramps below ground level, steep grade on loop ramp	2	Two free-flow ramps below ground level, steep grade on loop ramp but further from homes
Drainage	1	Minimum	4	Major, large pump station may be needed	3	Major, pump station may be needed	3	Major, pump station may be needed
Construction Costs	1	Low	4	Medium-High	2	Medium-Low	3	Medium
BNSF Railroad Impact	1	Minimum, SR 303L pier in BNSF ROW	4	Major, SR 303L pier in BNSF ROW, two structures under railroad, BNSF ROW needed for two ramps	3	Major, SR 303L pier in BNSF ROW, one structure under railroad, BNSF ROW needed for one ramp	3	Major, SR 303L pier in BNSF ROW, one structure under railroad, BNSF ROW needed for one ramp
Phased Development Potential	1	Not Applicable	4	None	2	Moderate	3	Limited
Constructibility	1	Minimum	4	Major, US 60 detour may be needed, BNSF shoo-flying may be required	4	Major, US 60 detour may be needed, BNSF shoo-flying may be required	4	Major, US 60 detour may be needed, BNSF shoo-flying may be required

APPENDIX B

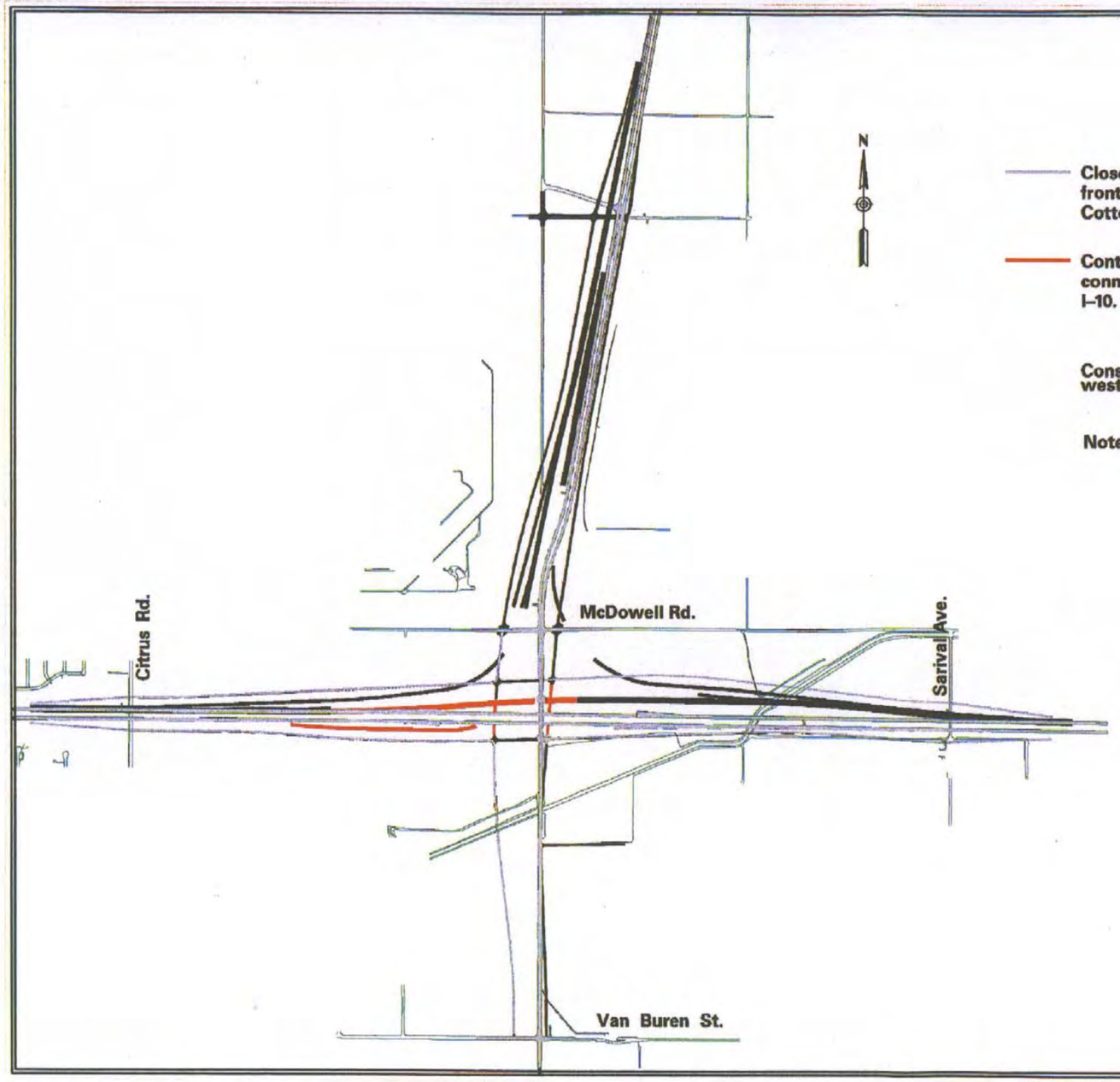
I-10 SYSTEM INTERCHANGE
CONSTRUCTION PHASING

Phase 1



SR 303L/I-10 TI
Phase Construction Drawing
12/10/03

Phase 2



Close I–10 ramps at Cotton Lane. Detour traffic via frontage roads. Remaining traffic stay on I–10 & Cotton Lane.

Continue with I–10 westbound roadway along with connecting frontage roads up to Cotton Lane and existing I–10. Partially construct EN ramp.

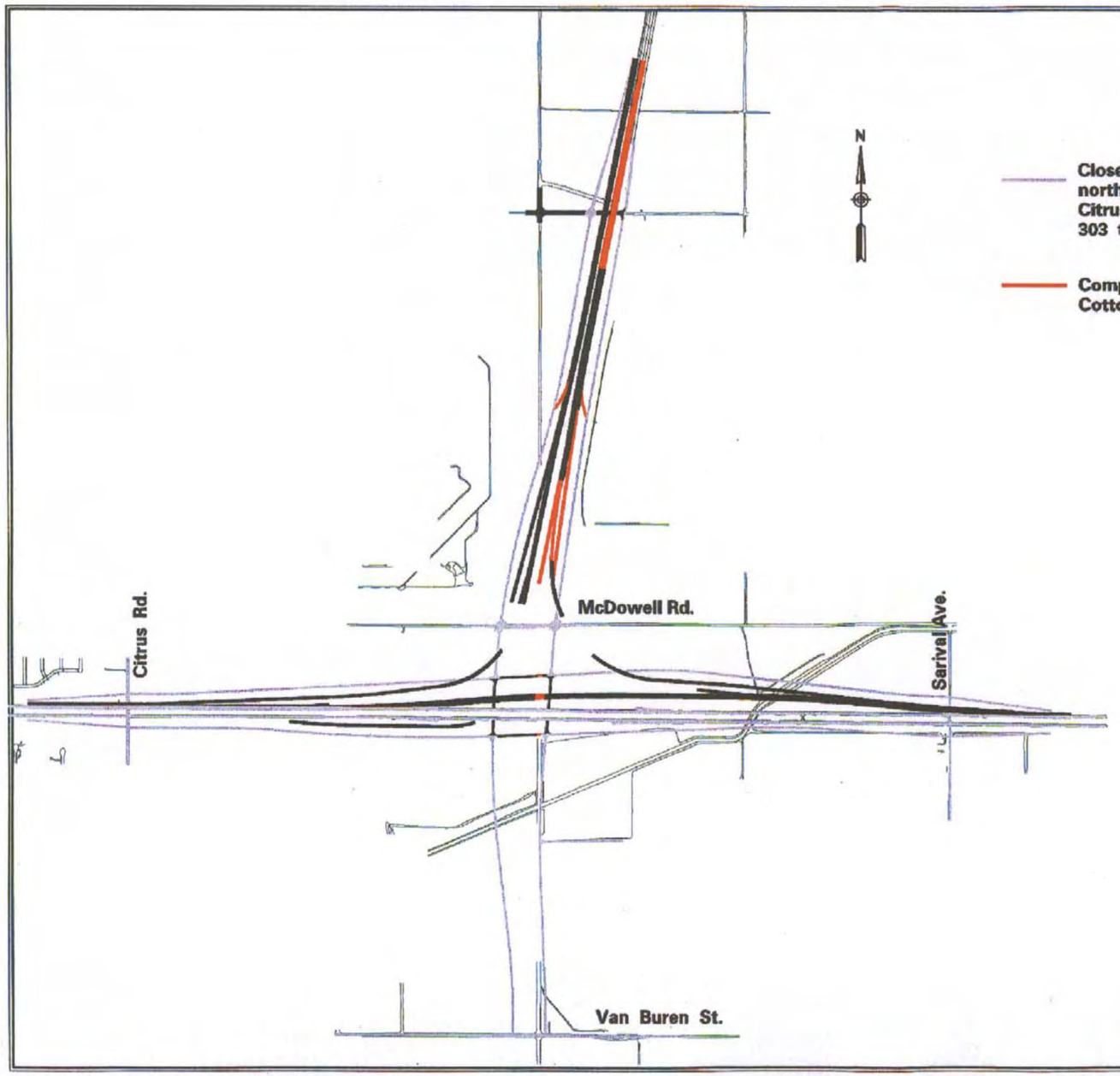
Construct detour through median to link east and westbound roadways of I–10 (Not Shown)

Note: Linkage from/to Cotton Lane and west side ramps is via McDowell Road and Van Buren Street.

SR 303L/I–10 TI
Phase Construction Drawing
12/10/03

2 of 7

Phase 3a



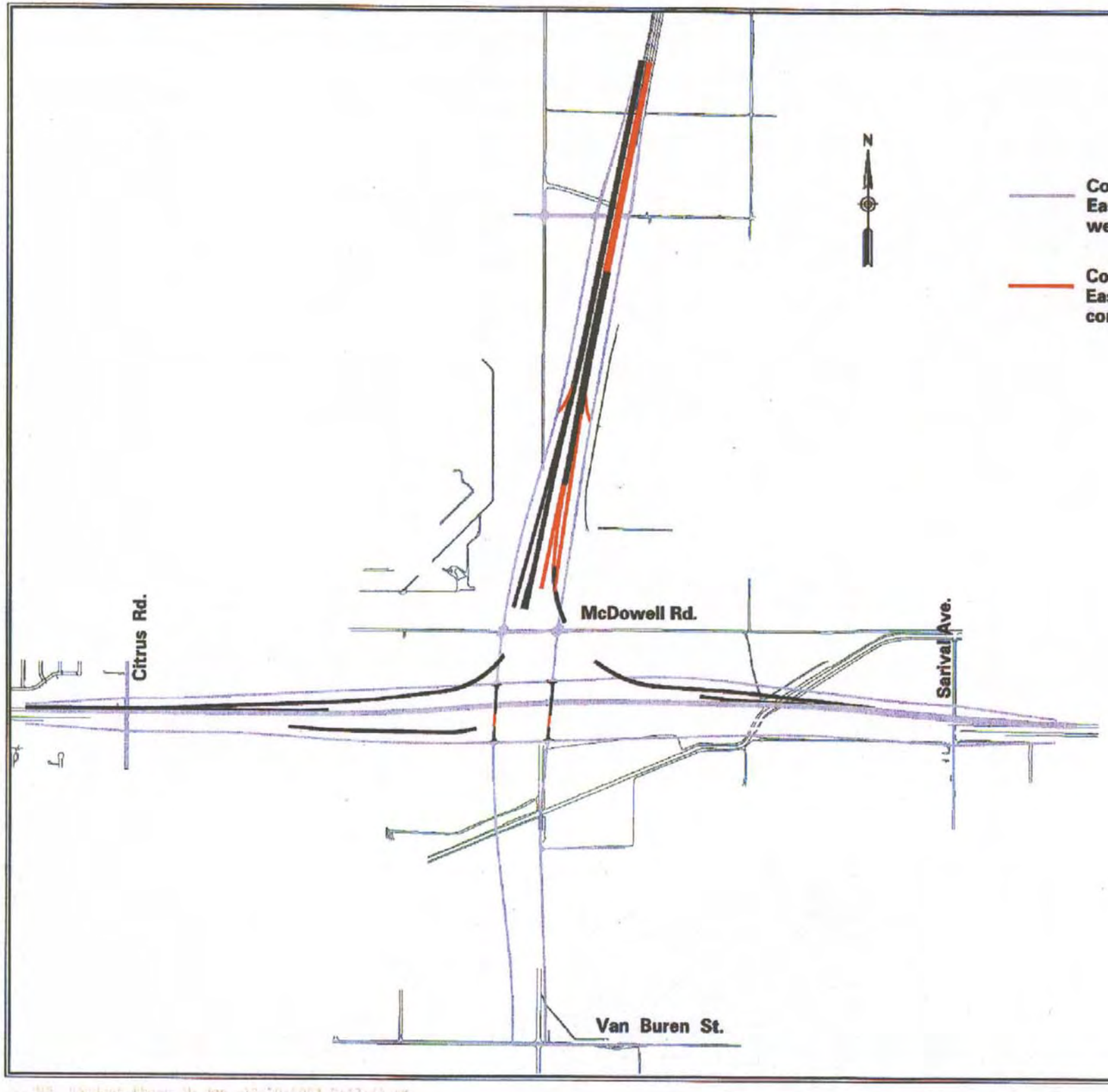
Close Cotton Lane / SR303L from Van Buren Street north to Thomas Road. Traffic detoured via Citrus Rd, Sarival Ave, and the frontage Roads 303 traffic on frontage roads

Complete embankment of I-10 westbound roadway across Cotton Lane. Construct temporary ramps to and from SR303L.

SR 303L/I-10 TI
Phase Construction Drawing
12/10/03

3 of 7

Phase 3b

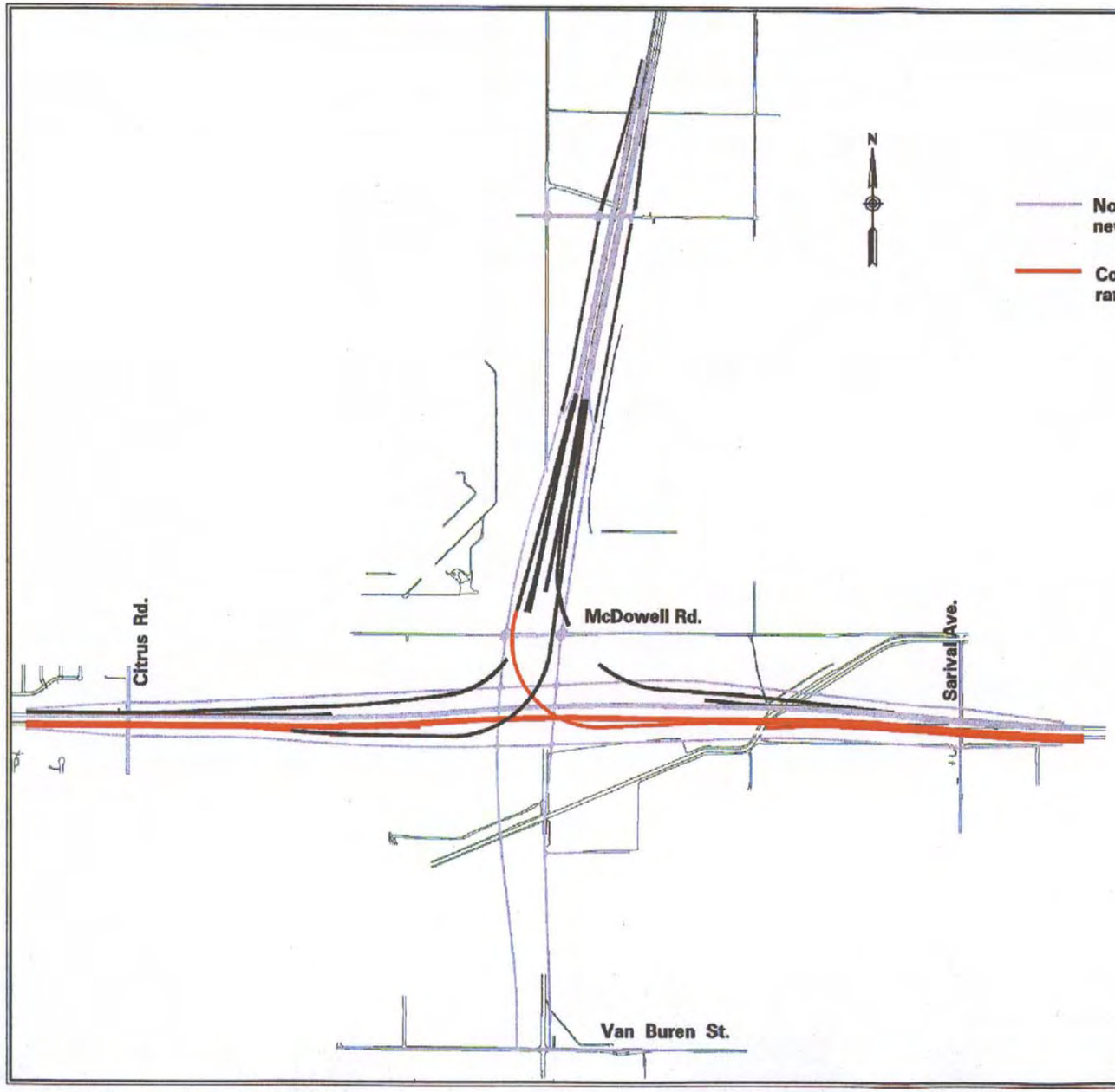


Cotton Lane / SR303L still closed as per Phase 3a. I-10 East bound and west bound traffic switched to new westbound roadway.

Complete frontage roads by excavating through existing East and westbound embankments of I-10. Continue with construction of SR303L

SR 303L/I-10 TI
Phase Construction Drawing
12/10/03

Phase 4



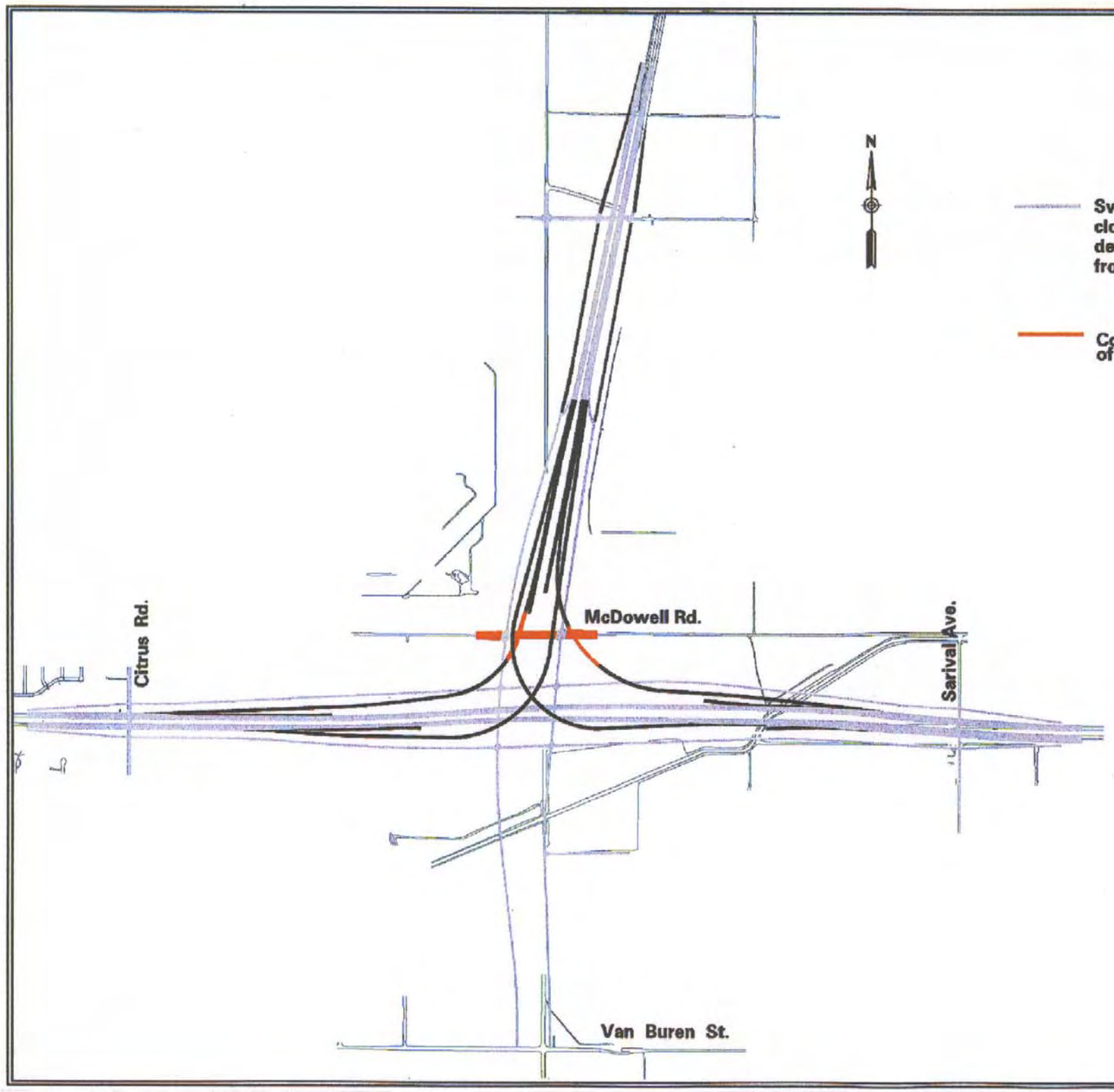
North/South route established via frontage roads. I–10 on new westbound roadway.

Complete eastbound roadway of I–10 along with EN & SE ramps.

SR 303/I–10 TI
Phase Construction Drawing
12/10/03

5 of 7

Phase 5



Switch I-10 Eastbound Traffic onto new eastbound roadway. close Mcdowell Road at junction with Cotton Lane. detour traffic via Citrus Road, Sarival Ave, and the frontage roads

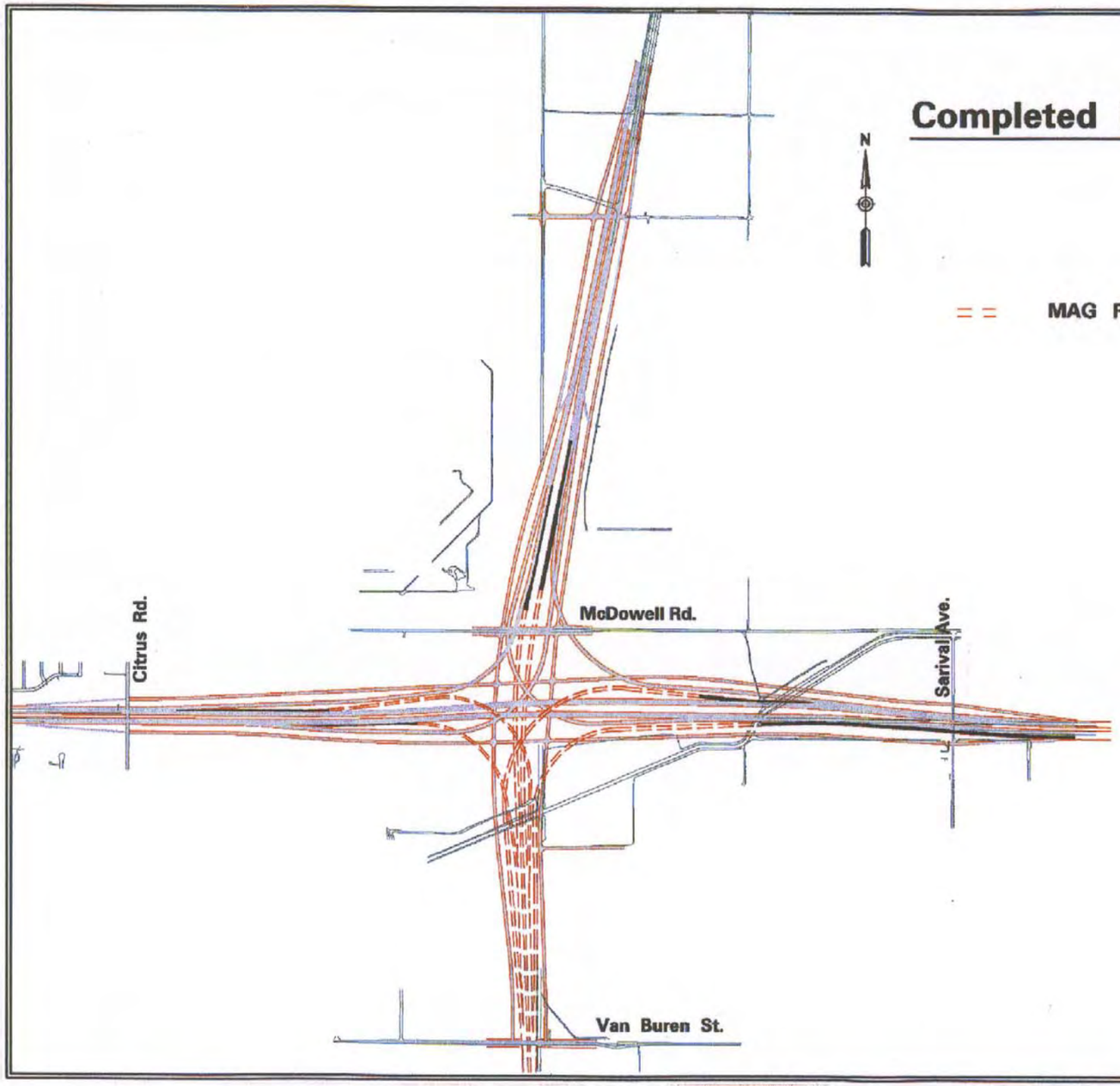
Complete ramps SW and WN along with reconstruction of McDowell Road.

Sr 303L/I-10 TI
Phase Construction Drawing
12/10023

6 of 7

Phase 6

Completed Interchange MAG Phase II



= = MAG Phase III

SR 303L/I-10 TI
Phase Construction Drawing
12/10/02

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APPENDIX C

HISTORY OF SR 303L

History of SR 303L
I-10 to US 60

Year	Description
1985	The *West Area Transportation Analysis* for MAG recommended Cotton Lane/ Northwest Loop freeway corridor be preserved for construction after 2005.
1985	The MAG Regional Council added the Cotton Lane/Northwest Loop Freeway to the MAG Freeway/Expressway Plan for right-of-way protection only.
1985	ADOT added the Cotton Lane and Northwest Loop Highways as State Route 517 to the State Highway System.
1985	Voters approved Proposition 300. In the voter pamphlet, reference is made to the Cotton Lane/Northwest Loop Freeway and it is shown on a map.
1986	MAG set priorities for freeway construction. Cotton Lane and the Northwest Loop are included for construction (not just right-of-way protection) as the lowest priorities for completion.
1986	MAG named the Cotton Lane/Northwest Loop Freeway the Estrella Freeway.
1987	ADOT designated the Estrella Freeway as Loop 303.
1987	ADOT completed a draft reconnaissance report that identified alternative alignments within the Cotton Lane corridor.
1988	The State Transportation Board adopted the location for the Estrella corridor from I-10 to Grand Avenue, April 14, 1988.
1988	MAG approved a funding priority to construct Loop 303 as an interim two-lane access controlled facility between Thomas Road and Grand Avenue. In exchange, developers dedicated 300 feet of right-of-way for most of this section on condition that it be under construction as a freeway by 2005.
1990	ADOT prepared the *Abstract Report on Agreement to Dedicate Real Property for Estrella Roadway Improvements from I-10 to Grand Avenue*. This document established the basic agreement between ADOT and property owners for dedication of right-of-way.
1991	ADOT completed the *Estrella Freeway Final Environmental Assessment* September 1991.
1991	ADOT completed the *Preliminary Location Plan and Profile* November 1991, which established the alignment and right-of-way needs.
1992	A two-lane access controlled facility on Loop 303 is opened to traffic between Thomas Road and Grand Avenue.
1994	Proposition 400 is defeated — it would have provided additional funding to complete the freeway system.
1995	The Governor requested the removal of the Estrella Freeway from freeway funding. MAG removed the Estrella Freeway from the planned freeway system due to the absence of an identified funding source.
1995	ADOT gives notice that it will abandon Loop 303 as an element of the State Highway System.
1995	Maricopa County responded to ADOT requesting retention of route on the State Highway System, continued preservation of the corridor and offering to assume lead role as “caretaker” for the corridor, June 15, 1995.
1998	MCDOT completed the *Estrella Corridor Study MC 85 to Interstate 17 Design Concept Report* March 1998. This report primarily dealt with Loop 303 east of Grand Avenue but it also recommended construction between I-10 and US 60 of an at-grade highway designed to MCDOT Rural Principal Arterial standards with a 65 mph design speed. This recommendation was based upon MCDOT being solely responsible for funding the project.
1998	ADOT State Transportation Board determined it will keep Loop 303 on the State Highway System. Formal action taken May 15, 1999.
1999	MAG adds the Estrella Expressway (Loop 303) from MC 85 to Grand Avenue back on the MAG Freeway/Expressway Plan as a four-lane controlled access facility. The section from Grand Avenue to I-17 is added as a study corridor.
1999	Concept plans completed for MCDOT for section from Union Hills Drive to Reems Road section lines.
2000	ADOT signs an Intergovernmental Agreement with Maricopa County for the County to assume responsibilities for maintenance and construction of SR 303L, July 31, 2000.

Year	Description
2000	MCDOT began construction of a two- to four-lane access controlled facility on Loop 303 between Clearview and Lake Pleasant Road with a grade separation over Grand Avenue and the Burlington Northern Santa Fe Railroad. A minimum of 300 feet of right-of-way was being obtained.
2000	Agreement reached with Del Webb to not include interchanges on SR 303L between Bell Road and Grand Avenue. Del Webb would design and construct grade separations over SR 303L for Clearview and Mountain View.
2001	MAG Regional Council selected corridor locations for SR 303L from Lake Pleasant Road to I-17 (along the Lone Mountain section line), January 24, 2001.
2001	MCDOT began preparation of a Design Concept Report from Indian School Road to Clearview Boulevard and an Environmental Assessment from I-10 to US 60, April 26, 2001.
2002	IDCR for SR 303L Indian School Road to Clearview Boulevard was completed along with a preliminary draft Environmental Assessment.
2002	MCDOT dedicates Patriots Bridge for SR 303L over US 60 and BNSF railroad. Bridge not opened to traffic. Two-lane interim roadway opened from Bell to US 60.
2002	Final Design Concept Report for SR 303L MC 85 to Indian School Road was completed by MCDOT and Goodyear. The study developed preliminary location and concept for I-10 system interchange.
2003	MCDOT began preparation of an expanded DCR for SR 303L from I-10 to US 60, March 21, 2003.
2003	MCDOT opens new four-lane divided interim roadway for SR 303L from McDowell Road to Indian School Road.
2003	MAG adopts new Regional Transportation Plan on November 25, 2003. Plan includes SR 303L and allocates funds to construct six-lane freeway.
2004	MCDOT opens to traffic a new four lane dividend roadway for interim SR 303L from US 60 to Happy Valley Parkway, May 15, 2004.
2004	MCDOT holds public meetings for SR 303L IDCR I-10 to US 60, May 17 and 19, 2004.
2006	ADOT resumes stewardship for the operation, maintenance, and construction of SR 303L as a fully controlled access facility. The ADOT/MCDOT IGA provided for certain reimbursement to MCDOT for right-of-way cost.
2006	SR 303L is named the “Bob Stump Memorial Parkway.”
2006	Proposition 400 is approved by voters to provide additional funding for SR 303L.
2007	ADOT designated STAN funds to accelerate intersection improvements at Cactus and Waddell roads and the Bell Road Interchange.

APPENDIX D

PREDICTED NOISE LEVEL CONTOURS

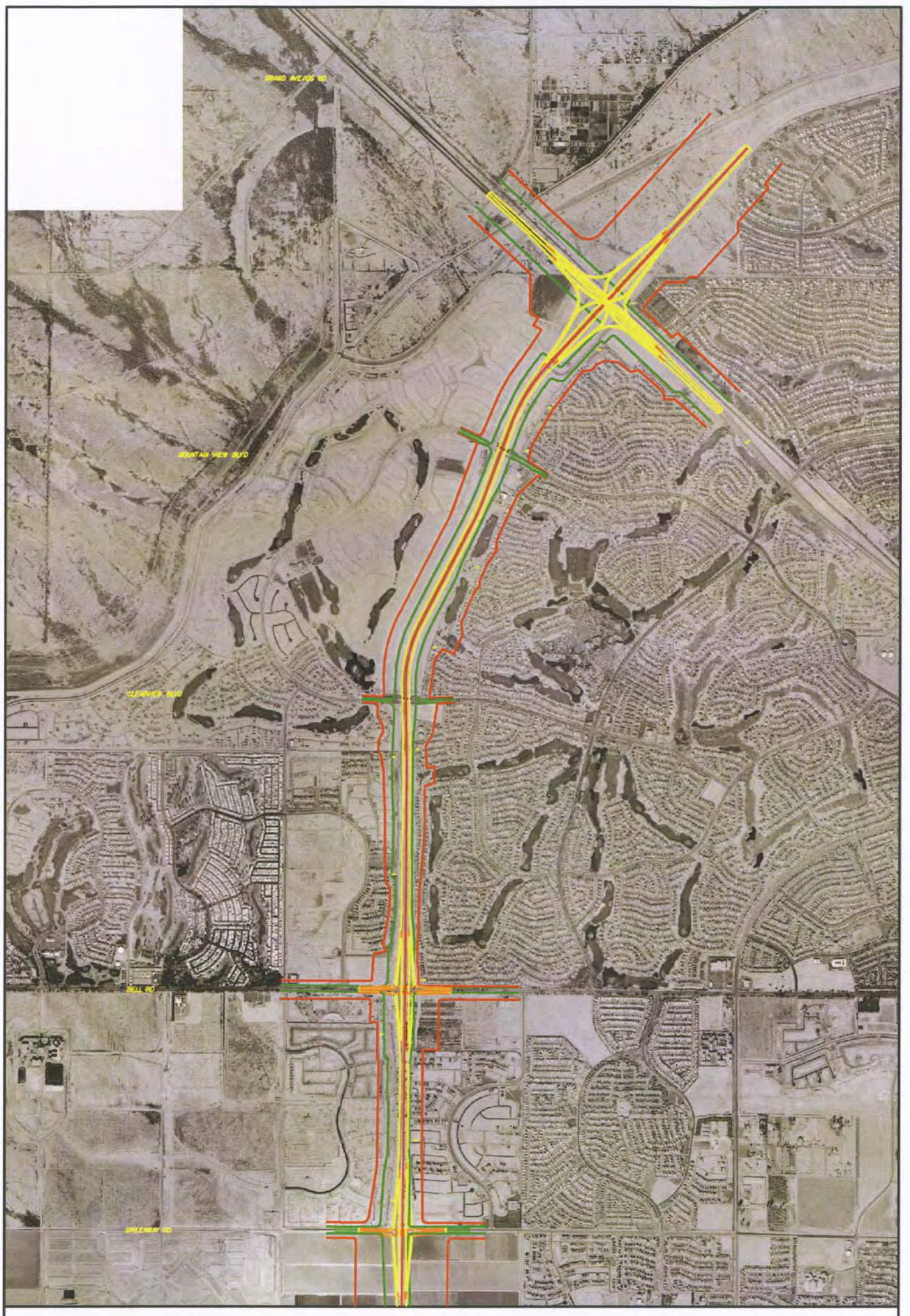

Figure 1
Existing and Unmitigated Future
Peak Traffic Hour Leq 64 dBA
Noise Contours

Existing Peak Hour Leq 64 dBA Noise Contour
Unmitigated Future (Year 2030) Peak Hour Leq 64 dBA Noise Contour

Environmental Assessment for SR 303L
MCDOT WO#69016

N

SCALE: 1"=2000'

Figure 2
Existing and Unmitigated Future
Peak Traffic Hour Leq 64 dBA
Noise Contours

Existing Peak Hour Leq 64 dBA Noise Contour
Unmitigated Future (Year 2030) Peak Hour Leq 64 dBA Noise Contour

Environmental Assessment for SR 303L
MCDOT WO#69016

N

SCALE: 1"=2000'

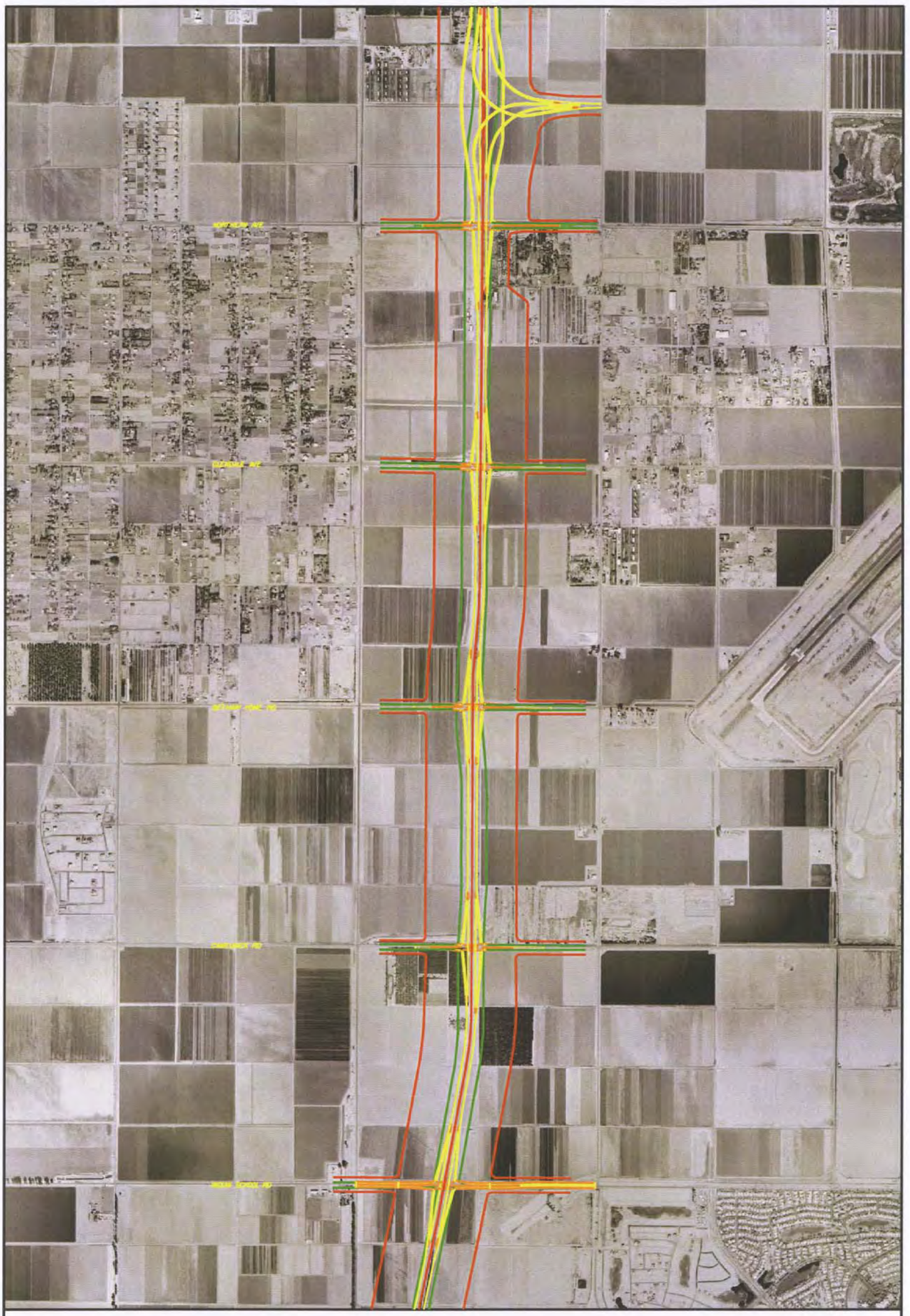

Figure 3
Existing and Unmitigated Future
Peak Traffic Hour Leq 64 dBA
Noise Contours

Existing Peak Hour Leq 64 dBA Noise Contour
Unmitigated Future (Year 2030) Peak Hour Leq 64 dBA Noise Contour

Environmental Assessment for SR 303L
MCDOT WO#69016

N

SCALE: 1"=2000'

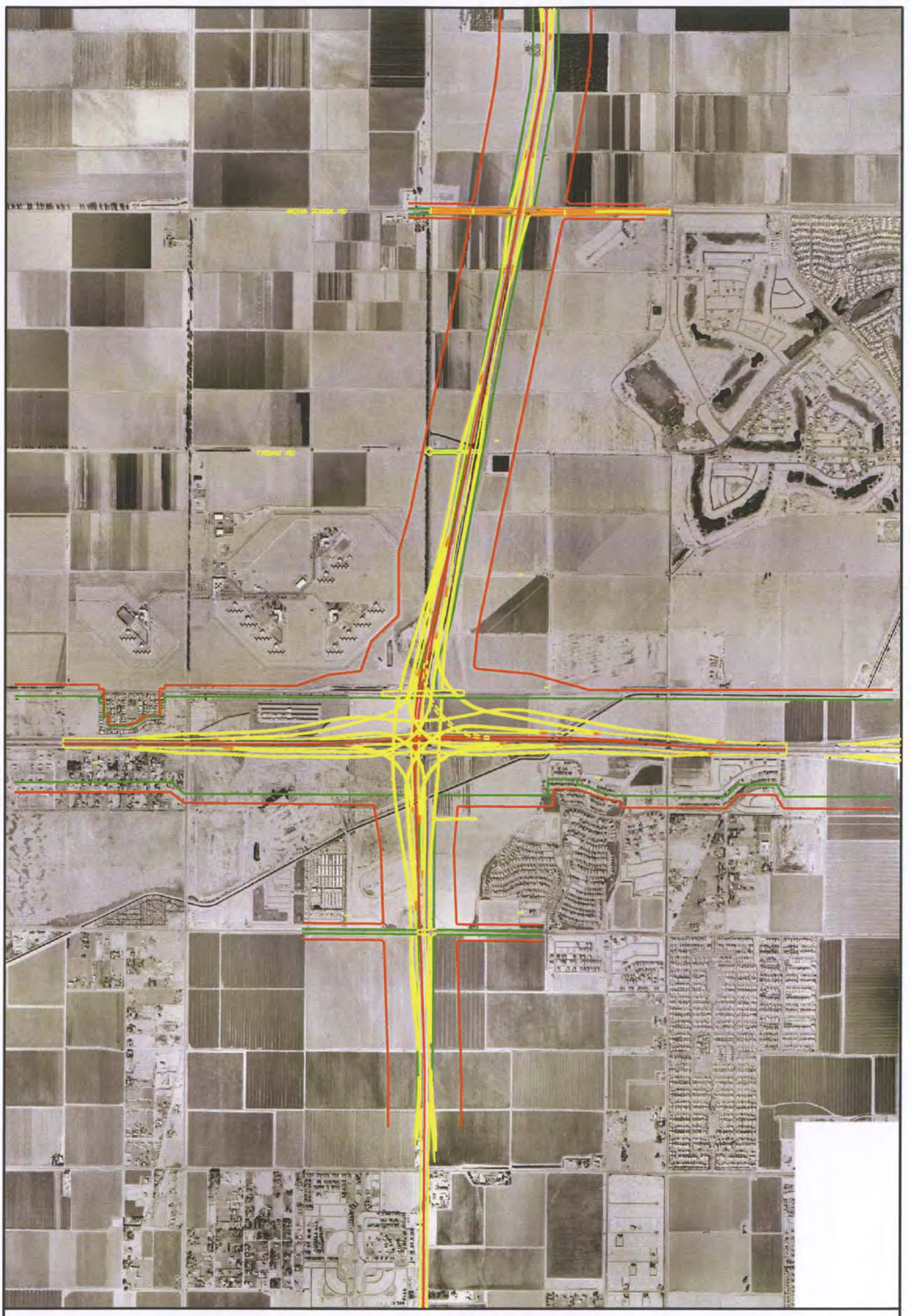

Figure 4
Existing and Unmitigated Future
Peak Traffic Hour Leq 64 dBA
Noise Contours